EtherLink II®

Adapter Guide

3662-02

EtherLink®

3Com®

EtherLink II®
Adapter Guide

A member of the EtherLink® product family

For 3Com User Group Information
1-800-NET-3Com

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FCC B Certification
3Com Corporation
Model No: 3C503
FCC ID: DF67CC3C503
Made in U.S.A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

NOTE: In order to maintain compliance with the limits Class B digital device, 3Com requires that you use good quality shielded interface cables when connecting to this device. Suggested cable types are:

Thin Ethernet:	3C530-xxx or equivalent
Thick Ethernet:	3C120-xxx or equivalent
Transceiver Cable:	3C110-xxx or equivalent

Use only 3Com transceivers and cables when connecting to 3Com products for proper operation and reduced radio frequency energy.

VDE Class B Compliance
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Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gërates angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

We hereby certify that the EtherLink II complies with the RFI Suppression Requirements of Vfg 1046/1984. The German Postal Service was notified that the equipment is being marketed. The German Postal Service has the right to re-test the equipment and to verify that it complies.

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Quick Installation Guide

For Experienced Installers

To install the EtherLink II® adapter and configure the software, follow these steps:

1. **Turn off the computer's power switch and disconnect any cables that are connected to the main system unit.**

2. **Check the I/O base address jumper for conflict with existing boards' I/O address settings.**

3. **Change the setting of the memory base address jumper if you want to use the adapter with the EtherStart™ II PROM or in shared memory mode.**

4. **Install the adapter in an expansion slot of the computer.**

5. **To run the diagnostics program, insert the EtherLink II diskette into drive A.**

6. **Make drive A the active drive.**

7. **Start the 3C503.EXE diagnostic program by typing:**

   ```
   3C503
   ```

8. **To install the software, you must first create or modify a workstation startup diskette or the workstation's hard disk. To create a diskette, go to step 9. To modify the diskette or hard disk, go to steps 10 through 13.**

9. **Create a workstation startup diskette with the MAKEDISK.EXE program, which is usually in the APPS directory of a network server.**

    a. **If you are using 3+Open™ software, refer to the *3+Open LAN Manager Installation and Setup Guide* or the *3+Open for 3Servers Installation and Setup Guide* for details.**

    b. **If are using 3+® software version 1.3.1 or later, refer to the *3+ Installation and Setup Guide* for details.**

10. **If you are running 3+Open network software, install either the ELNKII.OS2 or ELNKII.DOS driver onto your workstation startup diskette or hard disk.**

11. **If you are running 3+ network software, install the ETH503.SYS driver onto your workstation startup diskette or hard disk.**

12. **If you are using 3+ software versions between 1.2.1 and 1.3, use the 3+ INSTALL.BAT installation program to install the driver.**

13. **If you are using 3+ software version 1.2 or earlier, follow these steps:**

    a. **Copy the ETH503.SYS file from the EtherLink II diskette onto an existing workstation startup diskette or hard disk.**

    b. **Modify the CONFIG.SYS file contained on the workstation startup diskette or hard disk so that it specifies the ETH503.SYS driver.**

14. **Once you have installed the software:**

    a. **Connect the network cable to the adapter.**

    b. **Reboot the computer to begin operating on the network.**

Introduction

Package Contents

Figure 1 shows the contents of your EtherLink II® adapter package.

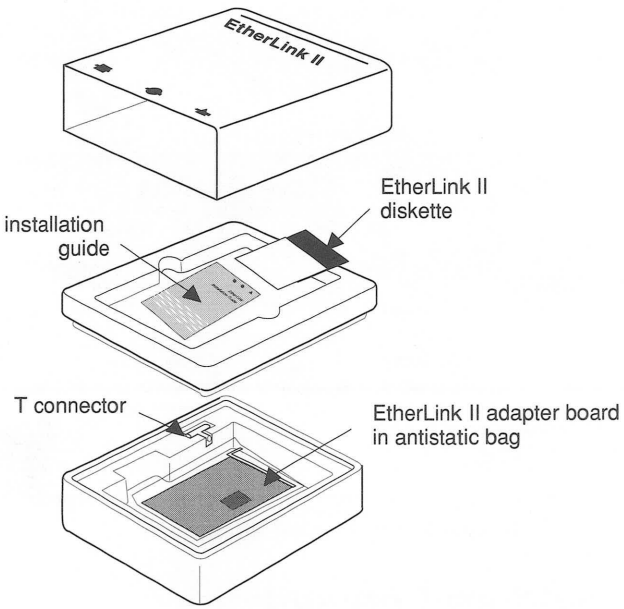

Figure 1. Package Contents

If any of the above items are missing from your package, contact your authorized network supplier.

EtherLink II Adapter

The EtherLink II adapter lets you connect your IBM® personal computer or compatible to an Ethernet network.

The EtherLink II adapter can be installed in an IBM PC®, PC XT™, PC AT® or compatible computer, and the IBM Personal System/2® Model 25 and 30 computers.

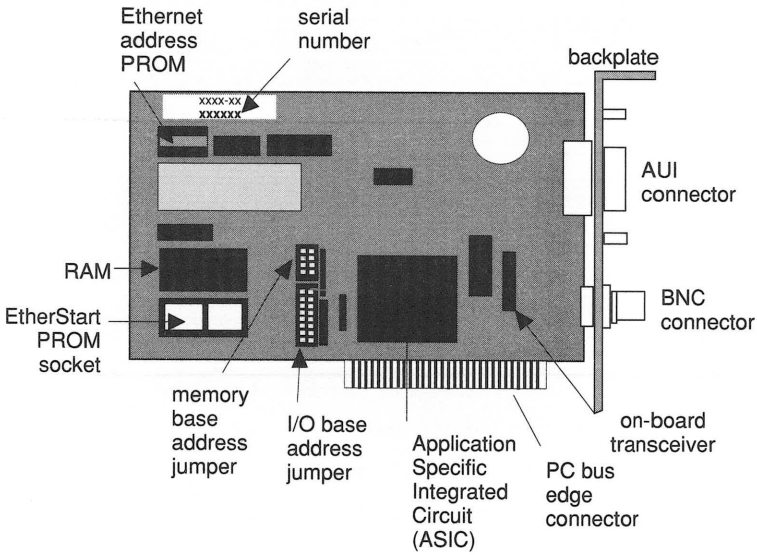

Figure 2. EtherLink II Adapter

Procedure Conventions

Procedure steps in this guide are presented in two levels. The first level, printed in bold type, briefly states the action to be performed. The second level text explains the action in more detail.

Keyboard Conventions

The following conventions regarding the keyboard are used in this guide.

Convention	Action
[Esc]	Command keys such as [Esc] are shown enclosed in brackets.
[Enter]	Means press the Enter (or Return) key.

Italic Type

Italic type represents variable information. For example:

/parameter:value

where each italicized name represents information you must input. You also type any italicized punctuation that appears.

References

Numbers are in decimal unless suffixed with an "h" for hexadecimal. For example:

10h = 16
0FFh = 255

Chapter 1
Installation

This chapter describes how to install the EtherLink II adapter in your computer. Perform the following steps to install the EtherLink II adapter:

1. **Turn off the computer's power switch and disconnect any cables that are connected to the main system unit.**

2. **Remove the computer's cover and choose an expansion slot.**

   You can install the EtherLink II adapter in any expansion slot, including PC AT (or compatible) 16-bit slots.

3. **Remove the expansion slot's backplate (see Figure 1-1).**

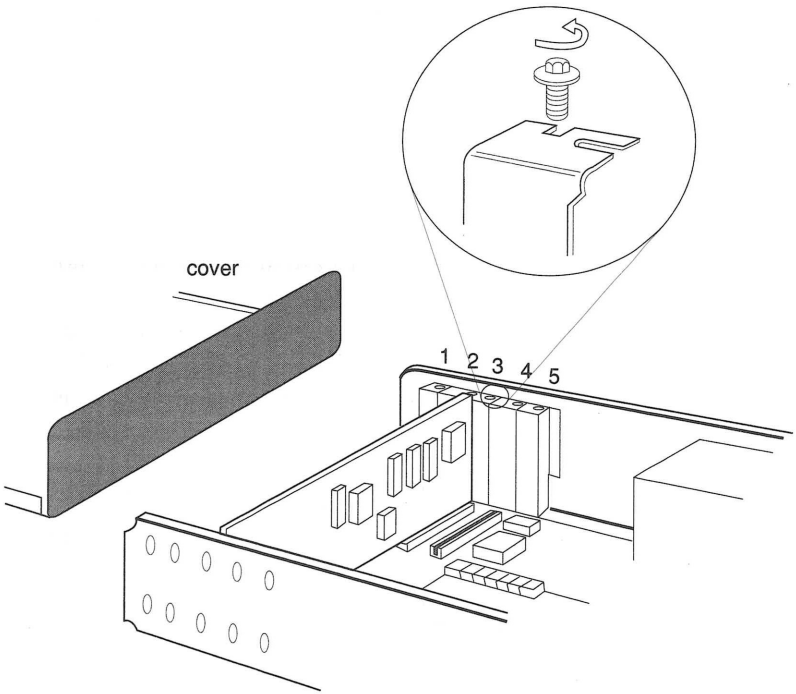

Figure 1-1. Removing the Backplate

CAUTION: *Discharge of static electricity can damage the adapter.*

4. Remove the EtherLink II adapter from its antistatic bag.

Hold the EtherLink II adapter by its corners, avoiding contact with any of the components or the PC bus connector. This prevents the discharge of static electricity through components on the adapter, which could damage it.

5. **Check the setting of the adapter's I/O base address jumper (see Figure 1-2).**

   The I/O base address jumper is factory set to 300h. Addresses 300 - 30Fh are used by the EtherLink II adapter at the factory setting.

   If any of these addresses are already used by another board, change the jumper setting of either the EtherLink II adapter or of the other board. See Chapter 4 for instructions on changing the EtherLink II adapter's jumper settings. For instructions on changing the conflicting board's setting, see its installation manual.

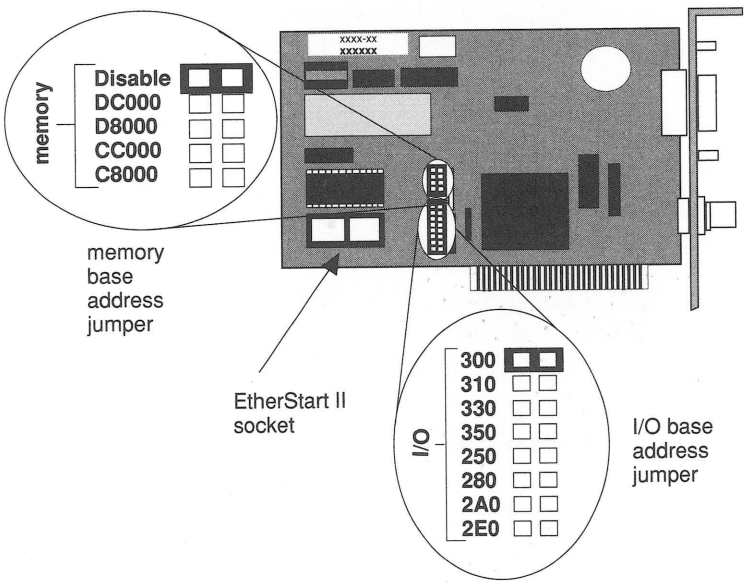

Figure 1-2. Option Jumpers

6. **If you want to use the adapter in shared memory mode, or if you are installing the optional EtherStart™ II PROM, change the setting of the adapter's memory base address jumper (see Figure 1-2).**

   The jumper is factory set in the DISABLE position. See Chapter 4 for more information.

   Install the EtherStart II PROM in the socket.

7. **Insert the EtherLink II adapter into the expansion slot and secure it with the captive screw.**

8. **Replace the computer's cover and reconnect all devices and cables removed in step 1, except the network cable. Turn the power on.**

9. **See Chapter 2 to run the diagnostic software.**

Software-selected Options

Some adapter options are set by modifying the CONFIG.SYS file on the startup diskette or hard disk. Before using your computer with the adapter installed, make sure that the settings for these options are not used by any other board installed in the computer. The options and their default settings are:

- DMA channel 1
- Interrupt level 3

If either of these settings is used by another board, you must change the option settings of the EtherLink II adapter or of the other board. See Chapter 4 for instructions on changing the EtherLink II adapter's option settings. For instructions on changing the conflicting board's settings, see its instruction manual.

After making sure that there are no option setting conflicts, run the diagnostics to test the EtherLink II adapter (see Chapter 2).

Chapter 2
Diagnostics

This chapter describes how to run diagnostic software to make sure the EtherLink II adapter is installed correctly and functioning properly in your computer. Before using the EtherLink II adapter in your network, make sure you run the diagnostic software.

To run the diagnostics, you need:

- EtherLink II diskette
- Second diskette or hard disk with DOS version 3.0 or later
- Loopback plug (optional)

Diagnostics Overview

The diagnostic software to test your EtherLink II adapter is supplied on the EtherLink II diskette. There are three groups of tests. Group 1 tests the physical components, connectors, and circuitry on the adapter. Group 2 includes the Group 1 tests and also tests the adapter's ability to transmit data over the network. Group 3 includes the Group 1 and 2 tests and also checks the adapter's ability to transmit and receive data while on the network.

Before You Begin

The Group 1 tests require only that the adapter be installed in your computer. Group 2 tests require that the adapter be connected to a loopback plug or a network. (For instructions on connecting a loopback plug, see the next section.) Group 3 tests require that the adapter be connected to a network on which an echo server has been set up. For instructions on setting up an echo server, see "Setting Up Your Computer as an Echo Server" later in this chapter.

Before using your adapter for the first time, run at least the Group 1 tests. You also should run the tests in the other two groups.

CAUTION: *If you are testing an operating PC server, notify all users of the server to save their work and log out from the network. The diagnostics interrupt the normal operation of the server, and work that is not saved may be lost.*

Connecting a Loopback Plug

If you do not have a loopback plug, you can order one from your network supplier or you can make your own. To assemble the loopback plug, connect two network cable terminators to a T connector as shown in Figure 2-1. (You can purchase terminators from your authorized network supplier.)

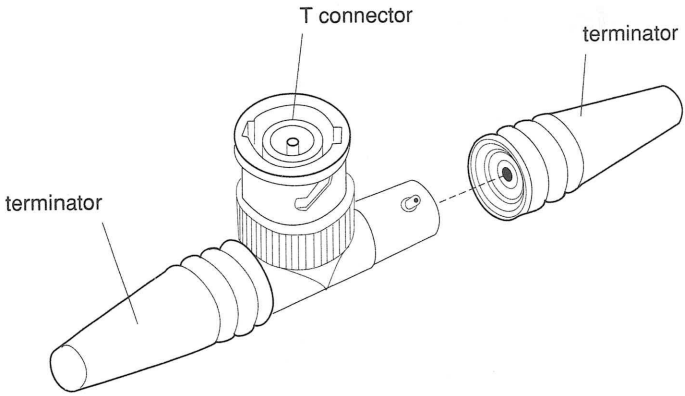

Figure 2-1. Assembling a Loopback Plug

Connect the loopback plug to the round BNC connector on the back of the EtherLink II adapter.

Starting the Diagnostics

1. **Start your computer.**
2. **Insert the EtherLink II diskette into drive A.**
3. **Make drive A the active drive by typing:**

   ```
   A:
   ```

4. **Start the diagnostic program 3C503.EXE by typing:**

   ```
   3C503
   ```

Figure 2-2 shows the first screen that appears.

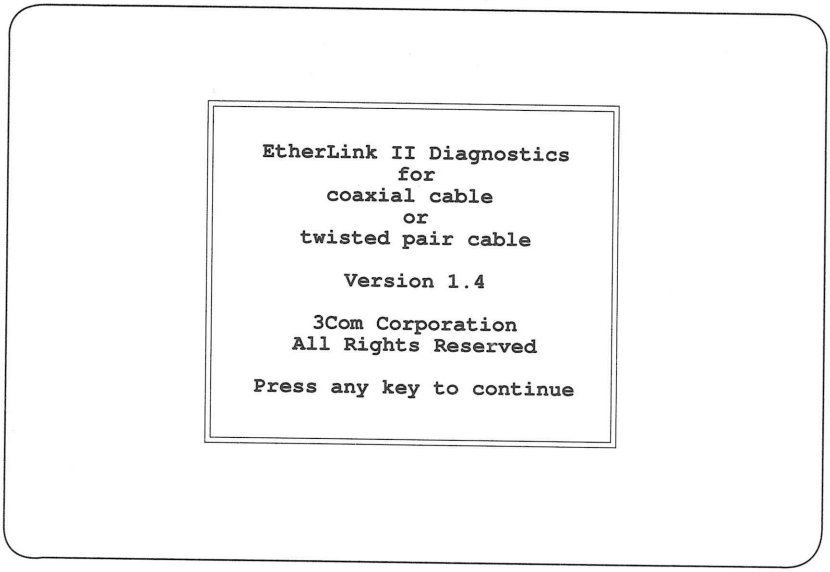

Figure 2-2. Introduction Screen to Diagnostics Program

5. **Press any key and the program displays the main menu shown in Figure 2-3.**

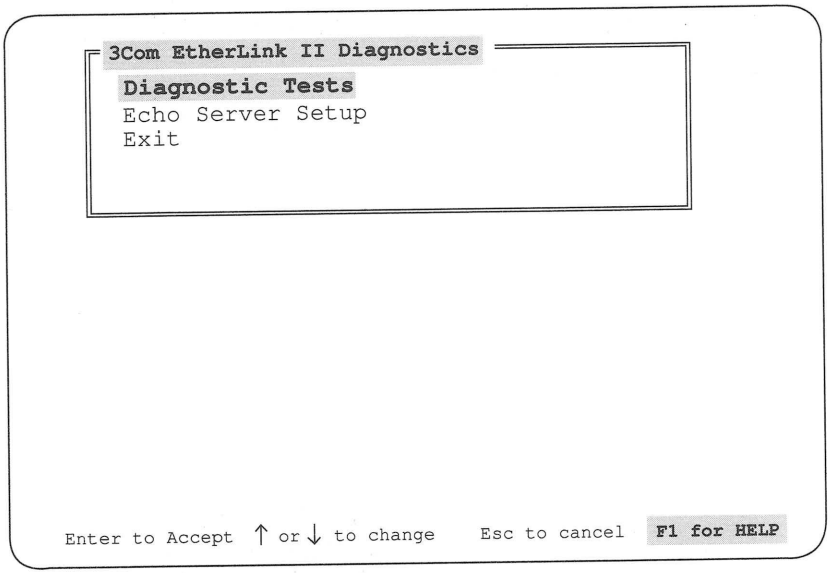

Figure 2-3. Main Menu

Using the Diagnostics

The diagnostic software is controlled from two types of screen displays: *menus* and *forms*. A menu is a list from which other menus or forms are chosen. A form has a list of parameter settings to choose from. The parameter settings you choose from the form are used to run the diagnostics.

Use the highlighted area to choose selections from menus and forms. Move the highlighted area around the menu or form using the keys described in Tables 2-1 and 2-2. The basic rules for moving the highlighted area are:

- Use the arrow keys [↑] and [↓] to move up and down the screen.

- Press the [Enter] key to select the highlighted item.

Tables 2-1 and 2-2 list the functions of the keys in menus and forms.

Table 2-1. Keys in a Menu

Key	Action
[↑]	move to previous item
[↓]	move to next item
[Enter]	open a form for the highlighted item
[Pg Up] or [Home]	move to first item in menu
[Pg Dn] or [End]	move to last item in menu

Table 2-2. Keys in a Form

Press	To move to
*[Enter] or [Tab]	next item in the form
[Shift+Tab]	previous item in the form
[Ctrl+Home]	first item in the form
[Ctrl+End]	last item in the form
[Ctrl+Enter]	next form or menu
[↑]	previous item in the box of choices
[↓]	next item in the box of choices
[Pg Up] or [Home]	first item in the box of choices
[Pg Dn] or [End]	last item in the box of choices

* After you fill in the last item in a form and press [Enter], you are prompted to accept the form. If the information on the form is complete and accurate, press [Enter] again. The form is closed and the program continues.

In some cases, you will not want to fill in every item. Pressing [Ctrl+Enter] accepts the changes you have made and closes the form.

If you want to leave the form at any time, press [Esc]. The form is closed but the parameters are not changed.

Help

If you need additional information about any item appearing on a form or menu, move to that item and press [F1] to display the help screen.

Testing the Adapter

Follow these steps to test the EtherLink II adapter:

1. **From the main menu, select the item Diagnostic Tests.**

2. **The program displays the Diagnostic Tests menu (see Figure 2-4). Select the group of tests you want to run.**

   For a description of these tests, see "Diagnostics Overview" at the beginning of this chapter. If you are running the Group 2 tests, you must connect a loopback plug or network cable to the adapter (see Chapter 3 to connect to a network cable). If you are running the Group 3 tests, you must connect a network cable to the adapter and make sure you have an echo server set up on the network. For instructions on setting up an echo server, see the section "Setting Up an Echo Server."

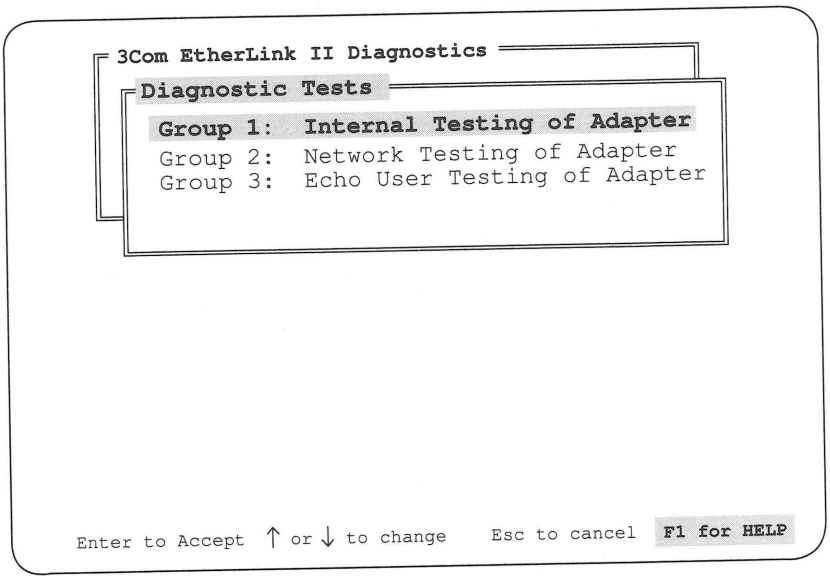
3Com EtherLink II Diagnostics
Diagnostic Tests
Group 1: Internal Testing of Adapter
Group 2: Network Testing of Adapter
Group 3: Echo User Testing of Adapter
Enter to Accept ↑ or ↓ to change
Esc to cancel
F1 for HELP

Figure 2-4. Diagnostic Tests Menu

The program now displays the Verify Test Values form (see Figure 2-5). This form displays the adapter's Ethernet address, its jumper settings, and its software settings.

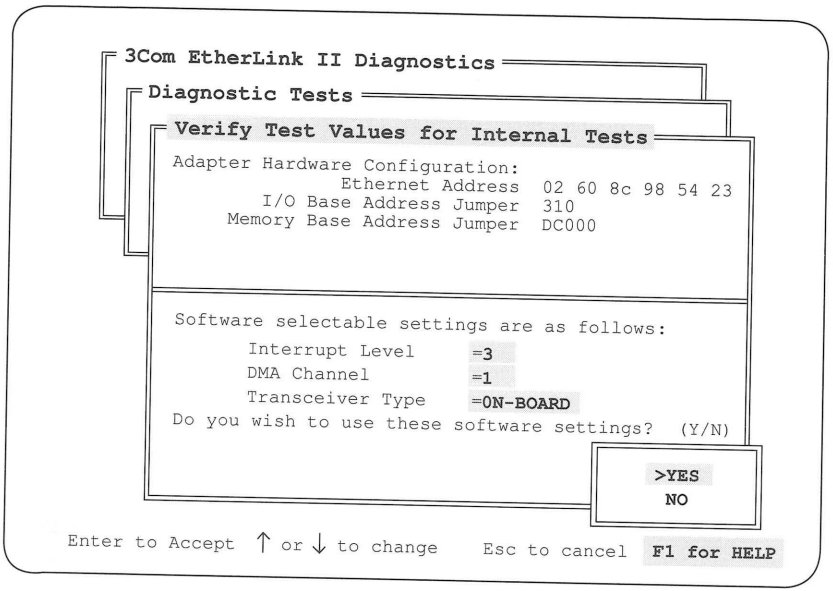
3Com EtherLink II Diagnostics
Diagnostic Tests
Verify Test Values for Internal Tests
Adapter Hardware Configuration:
Ethernet Address 02 60 8c 98 54 23
I/O Base Address Jumper 310
Memory Base Address Jumper DC000
Software selectable settings are as follows:
Interrupt Level =3
DMA Channel =1
Transceiver Type =ON-BOARD
Do you wish to use these software settings? (Y/N)
>YES
NO
Enter to Accept ↑ or ↓ to change
Esc to cancel
F1 for HELP

Figure 2-5. Verify Test Values Form

3. **The program asks if you want to use the current software settings. Use the arrow keys to select YES or NO, then press [Enter].**

   If you select YES, testing begins. If you select NO, the Change Test Values form is displayed (see Figure 2-6). Select the new settings you want to use.

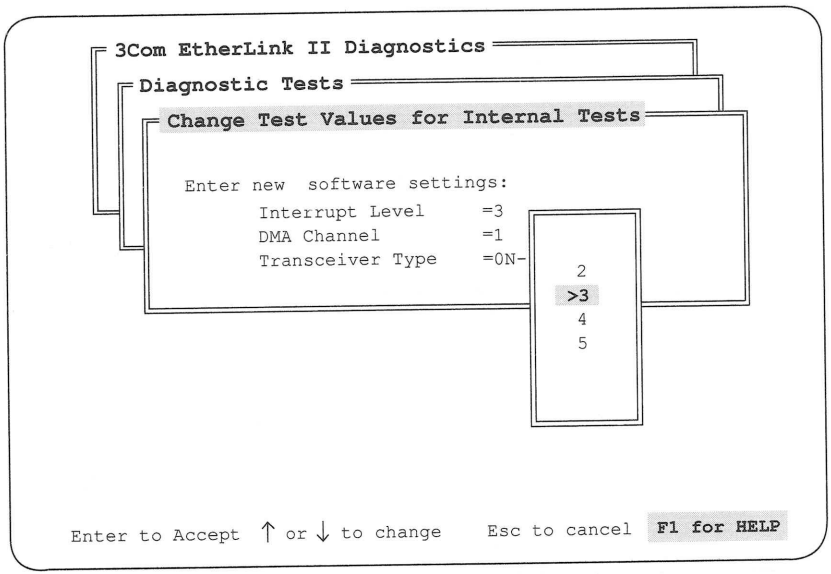

Figure 2-6. Change Test Values Form

After you fill in one or both of the forms, the program tests the adapter and displays the results.

If any tests fail, the program notifies you of the error and suggests actions you can take to solve the problem.

The "Troubleshooting" section, later in this chapter, provides more detailed suggestions for isolating and solving any problems you may encounter.

After the adapter passes all the tests, fill out the owner registration card at the back of this manual and return it to 3Com. Or, you can call 1-800-NET-3COM for immediate registration.

Setting Up an Echo Server

To run Group 3 diagnostics on the network, you need a workstation set up as an echo server. Follow these steps to set up an echo server:

1. **Select a network workstation to use as an echo server.**

2. **Start the diagnostic program on the echo server.**

   Refer to the manual for the adapter board currently in the echo server for instructions on starting the diagnostic program.

3. **From the main menu, select Echo Server Setup.**

   The program displays the Verify Test Values form. This form displays the adapter's Ethernet address, its jumper settings, and its software settings, if any have been defined.

4. **Select YES to begin the echo server setup or NO to switch to the Change Values form and enter the new values.**

   If the settings shown in the Verify Test Values form are incorrect, enter the correct ones on the Change Values form and press [Enter] to accept the new values. Select YES to begin the server setup.

   The program notifies you that your computer is now set up as an echo server.

5. **End the setup at any time by pressing [Esc].**

Troubleshooting

If the diagnostic tests fail, the adapter may not be defective. The problem may be incorrect option settings, option settings that conflict with other boards, or improper installation. Follow these steps to test the adapter further:

1. **Check the installation by reviewing the installation instructions in Chapter 1.**

CAUTION: Make sure you disconnect the power before inserting or removing the adapter from the computer.

2. **If you are running the Group 2 tests, make sure that the loopback plug is securely attached to the adapter's BNC connector or a properly cabled network is connected to the adapter.**

3. **If you are running the Group 3 tests, make sure that the adapter is connected to a properly cabled network and an echo server is set up on the network.**

   Inspect the cable and all connections.

4. **Make sure that the settings for the adapter's options are not the same settings used on any other boards installed in the computer.**

   Refer to Chapter 4 for information on setting the adapter's options.

5. **Try the adapter in another slot. The card slot may be defective.**

6. **Replace the failed adapter with a working EtherLink II adapter and run the diagnostics again.**

   Run the tests again on the working adapter, using the same option settings as those used on the failed adapter.

   If the working adapter passes all tests, the original adapter is probably defective. Notify your authorized network supplier.

Chapter 3
Connecting to the Network

This chapter describes how to connect the following types of network cables to the EtherLink II adapter:

- Thin Ethernet cable (using the on-board transceiver)
- Thick Ethernet transceiver cable (using an external transceiver)

Connecting to Thin Ethernet Cable

Follow these steps to connect the thin Ethernet cable:

1. **Locate the adapter's BNC connector.**
2. **Locate the T connector on the thin Ethernet cable.**
3. **Connect the T connector to the adapter's BNC connector (see Figure 3-1).**
   a. **Align the T connector's slots with the pegs on the BNC connector.**
   b. **Push the T connector on and twist it clockwise until it stops (see Figure 3-1).**

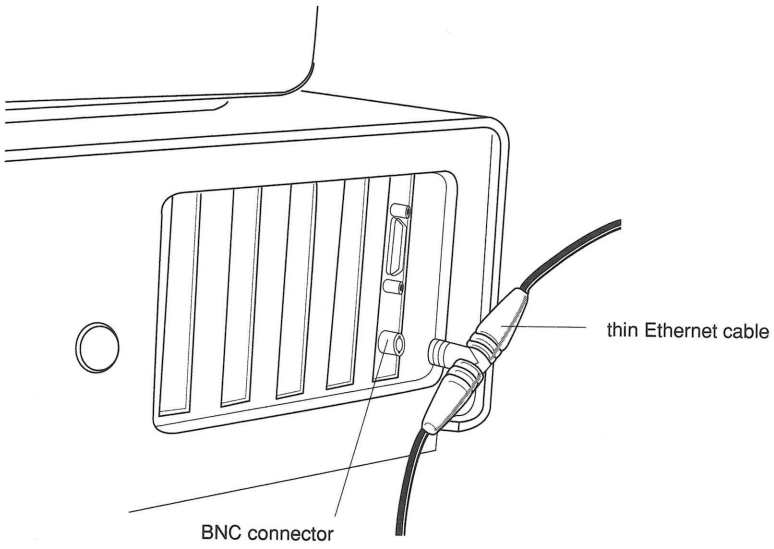

Figure 3-1. Connecting Thin Ethernet Cable

Connecting to Thick Ethernet Cable

The board's software is set to use the on-board transceiver and thin Ethernet cable. To use an external transceiver for thick Ethernet cable, you must modify the CONFIG.SYS file. For instructions on modifying this file, see Chapter 4.

Before connecting the external transceiver cable, you must connect a securing plate to the end of the cable so that it mates to the adapter's connector.

You can order a securing plate from your network supplier. To connect it, you will need a small flat-blade screwdriver.

Follow these steps, while referring to Figure 3-2, to connect the transceiver cable:

1. **Attach the clips to the securing plate.**

   Slide the clips onto both ends of the securing plate and insert the screws into the clips.

2. **Attach the securing plate to the end of the transceiver cable.**

   Align the slots in the securing plate with the posts on the end of the cable. Then press the plate on to the AUI connector on the adapter board.

3. **Connect the securing plate to the AUI connector on the EtherLink II adapter board.**

   Tighten the screws on the securing plate to hold the transceiver cable firmly in place.

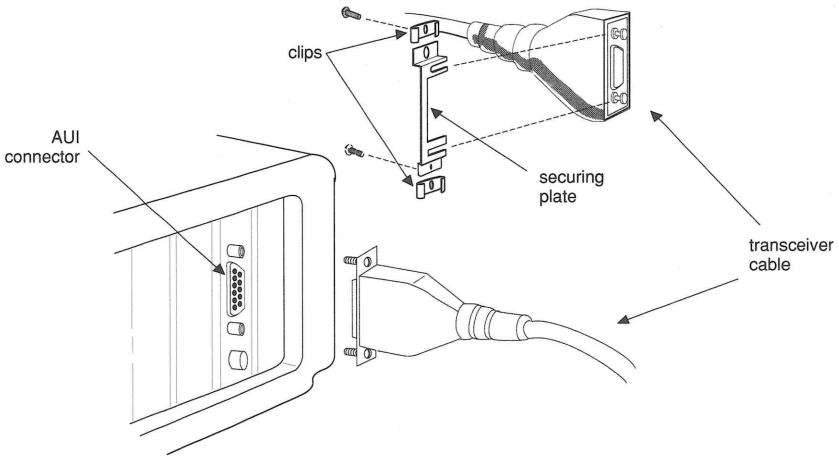

Figure 3-2. Connecting the Transceiver Cable

Chapter 4
Installing Software

This chapter describes how to make or modify a workstation startup diskette or modify your hard disk for use with the EtherLink II adapter, including instructions on changing the adapter's option settings.

Workstation Startup Diskette

A workstation startup diskette can be used to start and run the computer containing the EtherLink II adapter.

Creating a Workstation Startup Diskette

Workstation startup diskettes are made by the system administrator with the program supplied with the network operating system. With 3+ and 3+Open network software, use the MAKEDISK.EXE program, which is usually in the APPS directory of your network server. Refer to the following manuals for more information:

- If you are using 3+Open software, refer to the *3+Open LAN Manager Installation and Setup Guide* or the *3+Open for 3Servers Installation and Setup Guide* for details.
- If you are using 3+ software version 1.3.1 or later, refer to the *3+ Installation and Setup Guide* for details.
- If you are using another operating system, refer to those manuals for information.

Modifying an Existing Workstation Startup Diskette or Hard Disk

You may need to modify an existing workstation startup diskette or hard disk.

- If you are running 3+Open network software, you must install either the ELNKII.OS2 or ELNKII.DOS driver onto your workstation startup diskette or hard disk. If you are using a PC server, the ELNKII.OS2 driver is located on the *OS/2 Drivers* diskette in the subdirectory 3OPEN\SERVER\LANMAN\DRIVERS. The ELNKII.DOS driver is on the *DOS Drivers* diskette in the subdirectory 3OPEN\DOSDRV\MAC.

  If you are using a 3Server with 3+Open network software, the drivers are loaded from the *3+Open LAN Manager Installation* tape. The ELNKII.OS2 driver is located in 3OPEN\OS2DRV\MAC. The ELNKII.DOS driver is located in 3OPEN\DOSDRV\MAC. Use the NETSETUP program in 3+Open to install the drivers.

  The software will have preconfigured settings (DMA channel, interrupt level, and transceiver type). To alter these settings in 3+Open, you need to change the PROTOCOL.INI file. Refer to Chapter 7 in the *3+Open LAN Manager Technical Reference* for further information.

- If you are running 3+ network software, you must install the ETH503.SYS driver onto your workstation startup diskette or hard disk. The driver is located on your EtherLink II diskette.

- If you are using 3+ software versions between 1.2.1 and 1.3, use the 3+ INSTALL.BAT installation program to install the driver. You will be asked for settings and parameters. These can be found in Tables 4-2, 4-3, 4-4, and 4-5.

- If you are using 3+ software version 1.2 or earlier, follow these steps:

1. **Copy the ETH503.SYS file from the EtherLink II diskette onto an existing workstation startup diskette or hard disk. Place the file in the root directory.**

2. **Modify the CONFIG.SYS file contained on the workstation startup diskette or hard disk so that it specifies the ETH503.SYS driver. The file will be in the root directory.**

   a. **Locate the DEVICE= statement that specifies an adapter driver. For example:**

   ```
   DEVICE=ETH.SYS
   ```

   NOTE: *If there was previously no adapter board in your computer, the statement will not exist.*

   b. **Add or change the DEVICE= statement to specify the ETH503.SYS driver:**

   ```
   DEVICE=ETH503.SYS
   ```

   The ETH503.SYS driver should be the only adapter driver specified in the file. However, if you have multiple adapters you will need a second driver: 2ETH503.SYS.

If you have changed the board's I/O base address jumper setting or you want to change the software-selectable options, you must include parameters with the DEVICE=ETH503.SYS statement. See "Changing CONFIG.SYS for 3+ Software" later in this chapter for details.

3+NetConnect

Your EtherLink II diskette contains the 3+ driver 2ETH503.SYS. This is the remote network driver that you install on your 3+NetConnect™ server. For information on using this driver, refer to the *3+NetConnect User's Guide* and the *3+ Installation and Setup Guide*.

Changing Option Settings

The EtherLink II adapter has five available options. Three options are set through software; the other two are set by jumpers on the adapter. Table 4-1 lists each adapter option, the method for changing it, the factory setting, and the available settings.

Table 4-1. Option Settings

Option	Selection Method	Factory Setting	Available Settings
DMA Channel	Software	1	1, 2, 3
Interrupt Level	Software	3	2, 3, 4, 5
I/O Base Address	Jumper and Software	300h	300h, 310h, 330h, 350h, 250h, 280h, 2A0h, 2E0h
Memory Base Address*	Jumper	Disable	Disable, DC000h, D8000h, CC000h, C8000h
Transceiver Type†	Software	on-board (1)	on-board (1), external (2)

* This option determines the memory location of the optional EtherStart II PROM. If the PROM is not installed, and you are using the ETH503.SYS driver, you can set this option to run in shared memory mode and improve the performance of the adapter.

† This option determines whether you are using the adapter's on–board (BNC connector) or external (AUI connector) transceiver. The thin Ethernet cable attaches to the BNC connector; the thick Ethernet transceiver cable connects to the AUI connector.

Setting the Jumpers

You change the settings of your I/O base address or memory base address by moving a jumper on the adapter. The adapter uses 16 sequential I/O addresses, starting at the I/O base address selected. For example, the factory default setting, 300, uses addresses 300h to 30Fh.

If you change the factory setting of the I/O base address, you must also change the CONFIG.SYS file on the startup diskette or hard disk to use the new setting (see the next section, "Changing CONFIG.SYS for 3+ Software").

NOTE: *Do not use the 2E0h I/O base address setting in an IBM XT or AT computer or compatible (addresses 2E1h, 2E2h, and 2E3h are used by standard devices in these computers). All I/O base address settings are available in an IBM PC (or compatible) or Personal System/2 Model 25 or 30.*

To change the settings of the I/O base address or memory base address jumpers, locate the jumper for the option on the adapter (see Figure 4-1), and place the jumper over the pins that correspond to the setting you want.

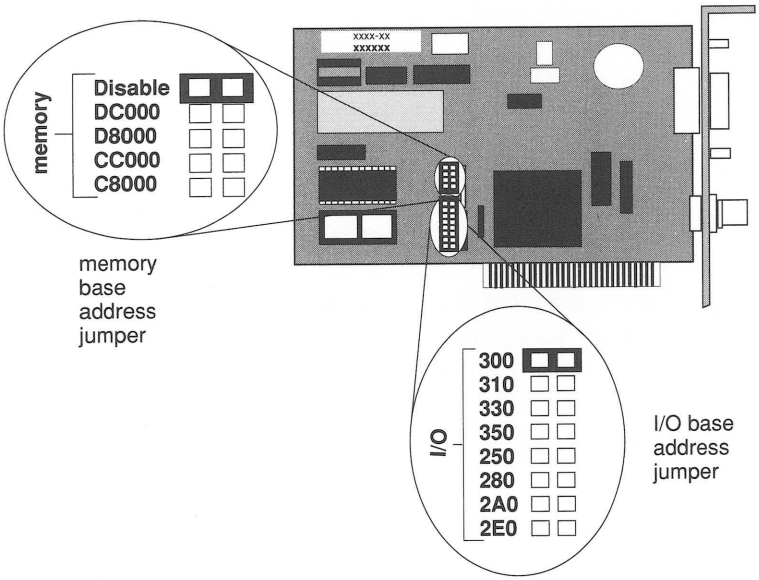

Figure 4-1. Option Jumpers

Changing CONFIG.SYS for 3+ Software

NOTE: *If you used the INSTALL.BAT program to install the driver, you have already made all of the necessary changes to the CONFIG.SYS file.*

You set your DMA channel, interrupt level, or transceiver type by changing the configuration file CONFIG.SYS. If you change the setting of the I/O base address jumper, you must also change CONFIG.SYS. If you change the memory base address jumper, you can also change the CONFIG.SYS file, but it is not necessary. (Refer to Table 4-3 for more information.)

NOTE: *You do not need to change the CONFIG.SYS file if you are running 3+Open software.*

Include the configuration information in the DEVICE=ETH503.SYS statement in the CONFIG.SYS file using this format:

```
DEVICE=ETH503.SYS /parameter:value /parameter:value
```

where the expression */parameter:value* can be repeated as often as required. The available parameter settings are described in Table 4-2. Each */parameter:value* group must be separated from the next group by one space and cannot include any blanks. You can include the parameters in any order.

For example, to use interrupt level 5, I/O base address 310, DMA channel 3, and an external transceiver (AUI connector), include the following statement in your CONFIG.SYS file:

```
DEVICE=ETH503.SYS /i:5 /a:310 /d:3 /t:2
```

NOTE: *The hex number is implied in the program. Do not type in 310h.*

To use the default values, you can omit all the parameters:

```
DEVICE=ETH503.SYS
```

Table 4-2. DEVICE=ETH503.SYS Parameters

Parameter	Available Settings
A (I/O base address)	250h, 280h, 2A0h, 2E0h, 300h, 310h, 330h, 350h Default = 300h The parameter setting must match the jumper setting on the adapter.
D (DMA channel)	1, 2, 3 Default = 1 This setting has an effect only when the M parameter is set to 1 or 3. (M settings 2 and 4 do not use DMA.)
I (Interrupt Level)	2, 3, 4, 5 Default = 3
M (Data Transfer Mode)	1, 2, 3, or 4 Default = 3 on a PC, XT (or compatible), PS/2 Model 25 or 30 Default = 4 on an AT (or compatible) (See Table 4-3 for more information.) The data transfer modes are: 1 DMA single-byte mode - gives control back to the CPU after each byte is transferred. The CPU gives control back to the DMA device after each full machine cycle. The DMA channel used is set with the D parameter.

(continued)

Table 4-2. DEVICE=ETH503.SYS Parameters (continued)

Parameter	Available Settings	
	2	Programmed I/O (PIO) loop - performs input and output to an I/O port and loops until the packet has been received or sent. Set the value to 2 if there is no DMA channel available on your computer. The D parameter is ignored when M = 2.
	3	DMA demand mode - the DMA channel is active continuously until the entire transfer is complete. This is the highest-performance setting on an IBM PC (or compatible). The DMA channel used is set with the D parameter.
	4	Programmed I/O (PIO) using REP instruction - substitutes this instruction instead of a loop. The D parameter is ignored when M = 4. This setting can only be used in Intel® 80186, 80286, or 80386-class machines. This is the highest-performance setting on an IBM AT (or compatible).
T (Transceiver Type)	1	Use on-board transceiver (BNC connector)
	2	Use external transceiver (AUI connector) Default = 1 (BNC connector)

Default Data Transfer Modes

Table 4-3 shows the default data transfer modes of the adapter. The default mode is determined by the memory address jumper setting. Shared memory mode is slightly faster than the other modes. The defaults can be overridden with the M parameter on the DEVICE=ETH503.SYS line.

Table 4-3. Data Transfer Mode Defaults

Transfer Modes Without EtherStart II PROM Installed			
		PS/2 models 25, 30 PC, PC XT	PC AT
Memory Address Jumper Setting	Disable	DMA demand mode	PIO with REP instruction
	C8000, CC000, D8000, DC000	shared memory mode	shared memory mode
Transfer Modes With EtherStart II PROM Installed			
		PS/2 models 25, 30 PC, PC XT	PC AT
Memory Address Jumper Setting	Disable	DMA demand mode*	PIO with REP instruction*
	C8000, CC000, D8000, DC000	DMA memory mode	PIO with REP instruction

*EtherStart II PROM is disabled.

Table 4-4 lists the DMA channel settings used by standard devices on the IBM PC, PC XT, PC AT, and the Personal System/2 Model 25 and 30, and compatibles. These settings are not available for use by the EtherLink II adapter if the specified device is installed in the computer. Settings that are not used by any standard device are listed as not used.

Table 4-4. DMA Settings of Standard Devices

DMA Settings	Device
PC	
1	Not used
2	Floppy drive
3	Not used
XT/AT	
1	SDLC adapter
2	Floppy drive (XT only)
2	Hard disk (AT only)
3	Hard disk (XT only)
3	Not used (AT only)
PS/2	
1	Not used
2	Floppy drive
3	Hard disk

Table 4-5 lists the interrupt level settings used by standard devices on the IBM PC, PC XT, PC AT, and the Personal System/2 Model 25 and 30 and compatibles. These settings are not available for use by the EtherLink II adapter if the specified device is installed in the computer. Settings that are not used by any standard device are listed as not used.

NOTE: Primary indicates the recommended setting. If there is no conflict with the primary setting, make sure there is also no conflict with the alternate settings.

Table 4-5. Interrupt Settings of Standard Devices

Settings	Device
PC	
2	Reserved
3	ASYNC adapter (alternate)
3	SDLC adapter (alternate)
3	BSC adapter (alternate)
3	Cluster (primary)
4	ASYNC adapter (primary)
4	SDLC adapter (primary)
4	BSC (primary)
5	Hard disk
XT/AT	
2	Redirected to 9
3	Serial port 2
3	BSC adapter (alternate)
3	PC network adapter
3	PC network adapter (alternate)
3	SDLC adapter
3	Cluster (primary) AT only
4	Serial port 1
4	BSC adapter
4	BSC adapter (alternate)
5	SDLC adapter
5	Parallel port 2
9	PC network adapter
9	PC network adapter (alternate)
PS/2	
2	Video
3	Not used
4	Serial
5	Hard disk

Appendix A
Error Messages

This appendix explains the error messages that may appear when you run the diagnostics program on the EtherLink II diskette. For information on running the diagnostics, refer to Chapter 2.

The error messages are listed alphabetically with a brief explanation of the message and any suggested action.

All DMA Channels failed. Unable to locate another channel.

Meaning Program tested DMA channels 1, 2, and 3, which failed.

Action Make sure the Etherlink II adapter is properly installed.

Make sure the proper value for the DMA channel is entered in the diagnostics program. See Table 4-4 for DMA settings.

If the problem persists, contact your authorized network supplier.

All Interrupt Levels failed. Unable to locate another level.

Meaning Program tested interrupt levels 2, 3, 4, and 5, which failed.

Action Make sure the Etherlink II adapter is properly installed.

Make sure the proper value for the interrupt level is entered in the diagnostics program. See Table 4-5 for interrupt settings.

If the problem persists, contact your network supplier.

ASIC test failed.

Meaning Program tested the Etherlink II adapter's custom chip, the application-specific integrated circuit (ASIC), and the test failed. The ASIC or the circuitry used to access the chip may not be functioning.

Action Make sure the Etherlink II adapter is installed properly.

Make sure the ASIC is installed properly.

If the problem persists, contact your network supplier.

Communication between EtherLink II and Echo Server failed.

Meaning Program tested the Etherlink II adapter's ability to transmit packets to an echo server and receive them back again. The echo server responded, but packet exchanging failed.

Action Make sure the echo server on the network is not reporting any errors.

Check the cable connections to the adapter and on the echo server.

If the problem persists, contact your authorized network supplier.

DMA Channel *x* failed. Try DMA Channel *y*.

Meaning Program tested DMA channel *x*, which failed. It found that DMA channel *y* was usable.

Action DMA channel *x* (the current setting) may be used by another installed board. Change the DMA channel to *y*.

If the problem persists, contact your authorized network supplier.

EtherLink II not found at specified I/O Base Address.

Meaning Program looked for the Etherlink II adapter at the I/O base address specified, but could not locate it.

Action Make sure:

- the Etherlink II adapter is installed properly.
- the I/O base address jumper is installed properly (see Figure 4-1). Set I/O base address jumper to a different setting.
- another installed board is not using the I/O addresses the Etherlink II is set to.

If the problem persists, contact your authorized network supplier.

Ethernet Address PROM test failed.

Meaning Program tested the Etherlink II adapter's ability to read the Ethernet address PROM. Test failed. The PROM may be defective, or the ASIC or the adapter's circuitry used to access the PROM may not be functioning.

Action Make sure the Ethernet address PROM is installed properly on the Etherlink II adapter.

If the problem persists, contact your authorized network supplier.

Interrupt Level *x* failed. Try Level *y*.

Meaning Program tested interrupt level *x*, which failed. It found interrupt level *y* was usable.

Action Interrupt level *x* (the current setting) may be used by another installed board. Change the interrupt level to *y*.

If the problem persists, contact your authorized network supplier.

Network Address Recognition test failed.

Meaning Program tested the Etherlink II adapter's network controller chip to make sure it could distinguish packets according to their Ethernet addresses. The test failed.

Action Contact your authorized network supplier.

Network Controller Chip test failed.

Meaning Program tested the Etherlink II adapter's network controller chip, which failed. The network controller chip or the circuitry used to access the chip may not be functioning.

Action Make sure the Etherlink II adapter is installed properly.

If the problem persists, contact your authorized network supplier.

Network Loopback test failed.

Meaning Program tested the Etherlink II adapter's ability to send and receive a packet of data. The test failed.

Action Make sure that the adapter is connected to a properly cabled network or a loopback plug.

If the problem persists, contact your authorized network supplier.

RAM test failed.

Meaning Program tested the EtherLink II adapter's on-board RAM, ASIC, and the circuitry used to access the RAM. One of these items failed.

Action Contact your authorized network supplier.

Simple Transmit test failed.

Meaning Program tested the Etherlink II adapter's ability to transmit a small packet of data to the transceiver. The test failed.

Action Make sure that the adapter is connected to a properly cabled network or to a loopback plug.

Check that the Transceiver Type value matches the cable connection. Use on-board if you are connecting the cable to the BNC connector. Use external if you are connecting the cable to the AUI connector.

If the problem persists, contact your authorized network supplier.

Unable to locate an Echo Server.

Meaning Program tested the Etherlink II adapter's ability to send packets to an echo server on the network. The adapter could not locate an echo server.

Action Make sure the adapter is connected to the network where the echo server has been set up.

If the problem persists, contact your authorized network supplier.

Appendix B
Technical Support

This section tells you how to do the following:

- Attempt to isolate and solve a network problem
- Confirm that a problem exists before you call your network supplier
- Contact your network supplier
- Obtain support services from your network supplier or 3Com Corporation
- Obtain a Return-to-Factory authorization for failed products

Problem Sources

There are five common sources of network problems:

- A network user might misunderstand a network command or procedure and get an unexpected result.
- A new hardware component is installed or configured incorrectly, or is incompatible.
- Application software can cause problems if it is not used correctly, if the software itself contains bugs, or if it is incompatible with network software or other application software.

- Cable problems can occur if the cable is connected or routed incorrectly, cable specifications are violated, the cable develops a mechanical or electrical fault, or the network is inadvertently disconnected.

- Overloaded servers can slow down network response times, or a personal computer or server can develop a hardware problem.

Problem-Solving Tools

The following tools can help you diagnose and solve network problems.

- A network diagram and log. Complete records and familiarity with your network configuration are invaluable tools in resolving problems.

- Ring loopback plugs. Loopback plugs let you isolate and test portions of the network to determine where the problem lies.

- Diagnostic software supplied with your 3Com server or board.

- The *3Com Compatible Products Directory* and your network supplier can help you confirm that your network components and software are compatible.

- Guides and manuals. Always refer to your network hardware and software guides and manuals to help you determine the nature of the problem. Examples of these resources include the *3Server386 Guide*, *3+Share User Guide*, and *3+ Messages* guide. Also check your computer's operating manual, the DOS manual, and your application software manuals.

- Digital ohmmeter. A digital ohmmeter or multimeter, available from your local electrical supply shop, will help you identify cable defects, such as an open circuit or a short circuit, by measuring the cable's DC resistance. If you do not have a digital ohmmeter, an analog meter can also be helpful.

For additional information and suggestions, consult the troubleshooting sections of applicable guides.

Before You Contact Your Network Supplier

These steps help you verify the problem.

1. If you are having trouble installing hardware or software on your network, see the guide supplied with the hardware or software, and repeat the installation procedures. Run any tests that are described to verify the current installation.

2. Check the *3Com Compatible Products Directory* to assure that the various components of your network are compatible and you have a supported configuration.

3. Check the cables and connectors to see that they have been attached correctly.

4. If the problem occurs on a single workstation, replace it with a known working unit and see if the problem persists.

5. If the problem continues, call your network supplier for assistance.

Contacting Your Network Supplier

You should have the following information at hand before you talk to your network supplier:

- A complete description of the problem, including the following: the nature of the problem, duration of the problem, when the problem occurs, the components with which the problem occurs, and whether the problem still occurs when the application is used off the network.

- An accurate list of the 3Com network equipment model and serial numbers, and 3Com software product part numbers, including the software revision levels. Include the date you purchased the products.

- An accurate list of your equipment types and model numbers for personal computers, monitors, fixed disks, printers, and so on; and a list of the third party software you are using, including DOS level and software revision level.

- A list of any changes that have been made to your system configuration prior to your problem, including hardware changes, operating system software or application software changes, or system administration procedures.

How to Secure Support Service

Your authorized 3Com network supplier is qualified to provide network planning, installation, hardware maintenance, applications training, and support services. Your network supplier is uniquely qualified to provide on-site services for products from multiple vendors.

Authorized Service Centers (ASC) and Complete Network Centers (CNC)

Local authorized service centers (ASC) and complete network centers (CNC) are a good source for receiving quality repairs and for obtaining spare parts. Often they are able to respond more quickly than the factory and can provide on-site services.

If your network supplier is not a 3Com authorized service center, contact 3Com at (800) NET-3COM to locate the ASC nearest you.

However, should you wish to augment your reseller's services with in-depth expertise on the 3Com components in your network, 3Com offers a variety of support services for purchase. These services include:

- Technical Bulletin Subscription Service
- On-line Technical Subscription Service
- Software Update Services
- Technical Assistance via telephone (annual contract or per incident)
- Annual contract covering all the above services

- Consulting services to assist in programmatic interface to 3Com products
- Return-to-factory repair services
- Spare parts and kits for large installation or in-house repairs

Information about these programs and services is available from your authorized 3Com network supplier or direct from 3Com. Should your network supplier, ASC, or CNC be unable to assist you, please contact the 3Com Customer Relations Department at (800) NET-3COM.

Returning Boards for Repair

Local authorized service centers are a good source of quality repair and spare parts. Often they are able to respond more quickly than the factory.

If you want to return boards direct to 3Com you need to obtain a return material authorization (RMA) number before shipping. To obtain this number, call (800) 876-3COM.

When you call, please have the following information:

- Name and phone number of technical contact
- Company name
- Shipping address
- Product name
- Serial number of unit and serial number of failed component
- Failure symptoms with diagnostic error messages

Warranty repairs must be accompanied by dated proof of purchase.

Payment is by COD, MasterCard®, or VISA®. Before shipping completed COD repairs, 3Com will call you with date of delivery and exact amount due.

Terms are available only if special authorization has been arranged with the 3Com accounting department. A hard copy of the PO must be enclosed with the return.

Confirm failures with diagnostics before returning boards to 3Com. Incoming products are tested carefully. When a hardware failure cannot be duplicated, the unit is put into extended test, cleaned, tuned and brought to the highest revision. There is a charge for this service. Return shipping and handling is included. This charge also applies to boards under warranty.

Shipping information:

- Package carefully. Use the original container if possible. Controller boards should be wrapped in an antistatic bag. Do not pack directly in popcorn. Do not return cables, connectors, or documentation.

- Mark the RMA number clearly on the outside of the shipping container.

- Call (800)-876-3COM, for the shipping address.

Factory repairs take five (5) working days and are returned second-day air. With weekends and combined shipping time, expect your unit to be gone two weeks. A 24-hour turnaround option, which includes Priority 1 return freight, is available for an additional expedite charge.

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